

# Medical Threat Assessment

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Medicine

# Objectives

- Understand the concept of “Medical Threat”
- Be exposed to the techniques and resources of Medical Threat Assessment (MTA)
- Understand who needs to know the MTA

# Medical Threat

- The sum of potential actions / conditions / infections / events that could reduce the ability of a unit to accomplish its mission

# Medical Threat

- Battle Injuries
  - What everyone thinks of!



<http://www.dvrbs.com/110thMedBnPhoto2.htm>

**MEDICAL TREATMENT NEAR THE FRONT**—An American soldier has a wound in his foot treated by a medical corpsman in a fox hole near the front line in the Persers area of France. (AP Wirephoto.)

# Medical Threat

- Battle Injuries
  - What everyone thinks of!
  - Historically, NOT the major player!!



<http://www.anaesthetist.com/icu/infect/malpix.htm>

# Medical Threat

- Battle Injuries
  - What everyone thinks of!
  - Historically, NOT the major player!!
  - Paid political announcement of PM



# Medical Threat

- Battle Injuries
- Non-battle Injuries
- Environmental Injuries
- Psychological Stress
- Infectious Disease

# Medical Threat

- Battle Injuries
- Non-battle Injuries
- Environmental Injuries
- Psychological Stress
- Infectious Disease

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# Medical Threat Assessment

- Battle Injury estimation very important but not a medical responsibility
- MTA = DNBI Assessment
- W, W, W, W, W

# Population at Risk

- MTA are 'Population Medicine'
  - MTA generated for a large group
  - Subgroups have different
- Populations at risk may not always be obvious

# Population at Risk

- Number
- Demographics
- Health Status
- Stress
- Training
- Equipment
- Activity

# Non-Battle Injuries

- Transportation
- Construction
- Unintended fires / explosions
- Sports

# Environmental Injuries

- Non-Living
  - Topographic
  - Energy exchange
  - Particulate
  - Pollution
- Living
  - Flora
  - Fauna



<http://www.junglewalk.com/frames.asp>



# Environmental Injuries

- Non-Living
  - LAT / LONG
  - Development
  - Terrain
  - Climate
  - Biomass
  - Shelter / Enclosures

# Environmental Injuries

- Immediate effects
- Delayed effects
- Really, really delayed effects

# Psychological Stress

- Easily underestimated
- Can't be simulated
- All sorts of Sx
- Acute and delayed effects

# Infectious Disease

- Arthropod-borne
- Fecal-Oral
- Respiratory
- Close personal contact
- Really close personal contact

# Sources of MTA Information

- AFMIC (DIA)
  - <http://mic.afmic.detrack.army.mil/>
  - MEDIC CD
  - Disease and Environmental Alert Reports (DEARS)
  - Classified and non-classified information

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# Sources of MTA Information

- Army Medical Surveillance Activity
  - [http://amsa.army.mil/AMSA/amsa\\_home.htm](http://amsa.army.mil/AMSA/amsa_home.htm)
  - Deployment instructions, forms, and links
  - Surveillance data, can be cut by many variables



## Army Medical Surveillance Activity


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AMSA, part of the US Army Center for Health Promotion and Preventive Medicine (USACHPPM), is the central epidemiological resource for the Army providing regularly scheduled and customer-requested analyses and reports to policy makers, medical planners, and researchers.




# Sources of MTA Information

- Navy Environmental Health Center
  - <http://www-nehc.med.navy.mil/>
  - Disease Risk Assessment (DISRAP)
  - Surveillance data




## Navy Environmental Health Center

**Ensure Navy and Marine Corps readiness through leadership in prevention of disease and promotion of health**





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**NAVY MEDICINE**  
**SUPPORTS OPERATION IRAQI FREEDOM**

 [Post-Deployment Health](#) [Workshop 2004](#)

Friday, August 15, 2003

Navy Environmental Health Center  
620 John Paul Jones Cir Ste 1100  
Portsmouth VA 23708-2103  
Phone: (757) 953-0700  
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DSN: 377

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Approved by: CIO  
[FOIA](#)



[US Navy, Welcome Aboard](#)



[Navy Opportunities](#)  
[Let the Journey Begin](#)

# Sources of MTA Information

- World Health Organization
  - <http://www.who.int/en/>
  - Weekly Epidemiologic Record



# World Health Organization


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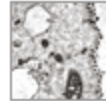
15 August 2003


**Feature:**  
**An international treaty for tobacco control**



Tobacco use is the leading cause of preventable death in the world today. With 4.9 million tobacco-related deaths per year, no other consumer product is as dangerous, or kills as many people, as tobacco. But with the adoption of a new, ground-breaking international treaty, the scene is now set to protect billions of people from the devastating impact of tobacco consumption and exposure to tobacco smoke.  
[Feature story](#)

**Features:**

[SARS: breaking the chains of transmission](#) 

[WHO: the way forward - an interview with LEE Jong-wook](#) 

[Features archive](#)

**New evidence links betel-quid and areca-nut chewing to cancer**

7 August 2003 -- Chewing betel quid - even without tobacco - can cause cancer in humans, according to new evidence from the International Agency for Research on Cancer (IARC). Earlier studies had suggested that only the tobacco in betel quid endangered people's health. IARC also concluded that chewing the areca nut can be carcinogenic. Betel-quid and areca-nut chewing is common practice amongst millions in communities around the world.  
[IARC press release](#) | [More information on cancer](#) | [IARC site](#)

**DISEASE OUTBREAKS**

**Legionellosis**  
France  
[Full text](#)

**Cholera**  
Liberia - Update 2  
[Full text](#)

**Severe acute respiratory syndrome (SARS)**  
[Latest information](#)

[Disease outbreak news](#)

**EMERGENCIES**




**Liberia crisis**  
[Latest information](#)

**Floods in Sudan**  
[Latest information](#)

[More information on emergencies](#)

**TOBACCO**

**Malaria**

# Sources of MTA Information

- Centers for Disease Control and Prevention (CDC)
  - <http://www.cdc.gov/travel/index.htm>
  - Health Information for the International Traveler (aka 'The Yellow Book')



**National Center for Infectious Diseases**  
**TRAVELERS' HEALTH**

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[Yellow Book 2003-2004](#) **NEW!**  
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### Destinations

Health information on specific destinations. What to know before you go.

Choose a Region

### Outbreaks

Information on outbreaks of concern to international travelers.

### Reference Materials

2003-2004 edition of *Health Information for International Travel* (the "[Yellow Book](#)") available!

Also, "[Blue Sheet](#)," links to other related sites, more.

### Diseases

Information about specific diseases that can affect travelers.

### Vaccinations

CDC's vaccination recommendations for travelers of all ages.

### Outbreaks

- [Notice: Outbreak of Encephalitis, Andhra Pradesh, India](#)  
Released August 8, 2003
- [SARS Outbreak Waning](#)  
Released August 1, 2003
- [Notice: Dengue Fever: Tropical and Subtropical Regions](#)  
Released July 22, 2003
- [Notice: Yellow Fever Vaccination](#)  
Released July 22, 2003
- [Typhoid Fever: Haiti](#)  
Released June 26, 2003

### In the News

- [Blood Transfusion Guidelines for International Travelers](#)
- [Typhoid Drug Resistance: India, Nepal](#)
- [FDA Creates Medication Guide for Lariam \(mefloquine hydrochloride\)](#)  
Released July 14, 2003
- [Meningococcal Vaccine \(Menomune\) Receives FDA Approval for 35-Day Reconstitution](#)

# Sources of MTA Information

- State Department
  - <http://www.state.gov/>
  - Travel Advisories
  - Country snapshots



# U.S. DEPARTMENT of STATE

## About the State Department

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## Travel and Living Abroad

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## Countries and Regions

Middle East Peace  
Iraq  
Afghanistan  
Country Background Notes

## HIGHLIGHTS

Friday, August 15, 2003

### Secretary Powell Discusses Current Issues

**Univision Interview (Aug. 13):** Among the topics Secretary Powell discussed were the war on terrorism, Iraq, Mexico, Cuba, Venezuela, Guatemala, his future plans, and U.S. relations with Latin America. [\[full text\]](#)

### Seeds of Peace

**Secretary Powell (Aug. 12):** "[I]t is so important for us to push this message constantly that the dreams that we all have for two people to live side by side in peace in the state of Israel and in Palestine will only come about when violence ends, when terror ends, when young people and old people, all together, join hands and say, 'Enough, enough. This must stop.' [\[full text\]](#)

### NATO and Afghanistan

NATO has assumed [leadership](#) of the International Security Assistance Force in Afghanistan. NATO's leadership of the force will help provide the secure environment for the accelerated efforts of the U.S. and the international community to help the Afghan government and people to reconstruct their country and rebuild its political institutions.



### Liberia

**Secretary Powell (Aug. 11) - Transfer of Power:** "We are very pleased at the developments we saw in Monrovia today: the peaceful and constitutional transfer of power from Charles Taylor to now President Blah and the departure of Mr. Taylor for Nigeria. We hope that all of the parties to this conflict will now recognize that it is time for the conflict to end." [\[full text\]](#)

**Deputy Spokesman Philip Reeker (Aug. 5) - ECOWAS Troops Arrive:** "The United States welcomes the arrival today in Monrovia of Nigerian soldiers who form the first element of an ECOWAS-led multinational force. The goal of this force is to help restore and maintain security in Liberia so that essential humanitarian assistance can be provided to the people of Liberia." [\[full text\]](#)

## IN OTHER NEWS



# Sources of MTA Information

- National Library of Medicine
  - <http://www.nlm.nih.gov/>
- USUHS LRC
  - MEDLINE, other searches

# Sources of MTA Information

- FM 8-33. Communicable Diseases in Man
- FM 21-10. Field Hygiene and Sanitation (or service equivalent)
- Current ACIP Recommendations (CDC)

# Factors Affecting MTA Information

- Under reporting, poor reporting
- Biases
- Politics
- Biology of indigenous populations

# MTA Information

- An absence of reporting  $\neq$  absence of risk
- Use many sources
- Use feet on the ground

# MTA Information

- A painstakingly thorough list of all possible medical threats is necessary
- And worthless to military leaders



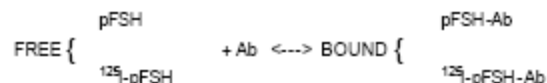
## PORCINE FSH (AH P004)

### RADIOIMMUNOLOGICAL DETERMINATION OF FOLLITROPIN IN PORCINE SERUM OR PLASMA.

**1. INTENDED USE:** For the **IN VITRO** determination of serum and plasma porcine follitropin (pFSH) level.

#### 2. PRINCIPLE OF THE METHOD

The porcine FSH assay is based on the competition between the FSH of the porcine sample and a  $^{125}$ I-labelled porcine FSH tracer for binding to a highly specific rabbit polyclonal antibody (Ab), according to the following equation:



Since the concentrations of  $^{125}$ I-pFSH and Ab are constant, the advancing state of the equation depends on the concentration of porcine FSH in the sample. After incubation, separation of bound from free is achieved by the PEG-second antibody method. The radioactive bound fraction is precipitated by centrifugation and counted in a gamma counter.

Porcine sample concentrations are read from a calibration curve and the results are expressed in ng/ml.

#### 3. MATERIAL PROVIDED AND STORAGE

Stored at 2-8°C, the material can be used up to the expiration date printed on each label.

- Before use, reconstitute the content of the **standard 0** with 2 ml of distilled water. Mix gently to avoid foaming. Wait at least 15 minutes after solubilization before dispensing. After reconstitution, the standard 0 is stable for two weeks at 2-8°C or for longer period if stored at -20°C.

3.1.  $^{125}$ I-porcine FSH tracer (red) (11 ml)

1 vial  $^{125}$ I-porcine FSH tracer in buffer with a stabilizer, a preservative (NaN<sub>3</sub> <

#### 5. METHODOLOGY

##### 5.1. Collection and handling of blood samples.

Blood samples may be collected, either into dry tubes or in the presence of anti-coagulant (EDTA or heparin).

After separation from the red blood cells, plasma or serum samples may be assayed immediately, within 24 hours if stored at 2-8°C or later, after periods as long as several months, if stored at -20°C. Repeated freezing and thawing must be avoided.

##### 5.2. Assay procedure

Reagents stored at 2-8°C must be brought at room temperature prior to use. If not already done, reconstitute the content of the standard 0 with 2 ml of distilled water and the standards S1-S6 and controls C1-C2 with 1 ml distilled water.

Label the tubes for T ("Total counts"), NSB (Non Specific Binding), standards, control and samples. Perform the assay in duplicate. Standards, controls and samples must be assayed at the same time.

- NSB**: Pipette 100  $\mu$ l of zero standard and 100  $\mu$ l of distilled water in the NSB tubes.
- STANDARD CURVE**: Pipette 100  $\mu$ l of each standard solution (included 0 standard) to the corresponding tubes.
- SAMPLES and CONTROLS**: Pipette 100  $\mu$ l of samples or controls to the corresponding tubes.
- Add 100  $\mu$ l of anti-pFSH antiserum (blue) to each tube, except NSB and "Total count" tubes. Mix all tubes with a vortex mixer.
- Incubate 2 hours at room temperature.
- Add 100  $\mu$ l of  $^{125}$ I-pFSH tracer (red) to each tube. « Total Count »

# MTA Brief

- Anyone can collect the information
- You have to synthesize, distill, & prioritize
- For many audiences

# MTA Brief Matrix

High M / M

Low M / M

High Risk

**1**

2

Low Risk

2

4



# MTA Brief

- Short Incubation
  - Acute Gastroenteritides (AGE)
  - Some Respiratory (URI)
  - Sexually Transmitted Illnesses (STI)
  - Some Arthropod-borne Dz
  - Injuries

# MTA Brief

- Longer Incubation
  - Some Respiratory (URI)
  - Sexually Transmitted Illnesses (STI)
  - Some Arthropod-borne Dz
  - Some GI Dz, esp Hepatidites

# MTA Format

- Define PAR and Site
- Languages
- Climate
- Jet Lag
- Stress
- Water & Food

# MTA Format

- Local Electricity
- Host Medical Facilities
- Military Medical Facilities
- Animal\* / Plants
- Misc info (e.g., earthquakes, etc.)
- Personal Hygiene
- Safety Issues

# Don't Forget!



<http://caretakers.boker.org.il/israel/einavdat/scorpi>

# MTA Format

- Injuries of Operational Importance
  - By phase of operation
  - By type of mission
- Diseases of Operational Importance
  - Brief Incubation
  - Longer Incubation

# MTA Format

- Bring it home with MTA MATRIX
- Countermeasures with source and cost

# MTA Brief Matrix

High M / M

Low M / M

High Risk

**1**

2

Low Risk

2

4



# MTA Audiences

- Commanders
- Medical Officers
- Troops

# Commanders

- Responsibilities
  - Accomplish mission
  - Safety of subordinates
- Need to know the 'Bang for the Buck' answers
- Will ask for the rest if necessary
- Assimilate data well
- Avoid medical jargon

# Medical Types

- Need to be able to adapt their thought processes to new threats
- Fever and HA in February in Watertown, NY is probably the flu...
- MUST buy into Surveillance

# Troops

- Are frightened and anxious
- Are not medically sophisticated
- Are often not highly educated
- Often are '18 & Invincible'

# Medical Threat Assessment

- Not a static document
- Needs continual assessment & revision before, during, and after deployment
- Assessment requires  
SURVEILLANCE

# Medical Threat Assessment

- May be one of the most important jobs you ever do
- May or may not be in your future
- Prepare now as if it is and thousands of lives depend on it!